

E+ business partners

NEWSLETTER

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U.S. BANK UPGRADES DRIVES, MOTORS

MDT REDUCES COOLING COSTS

VARIABLE SPEED DRIVES

STAFF PROFILE: VICKI LYNNE, P.E.

Learn How to Improve Your Energy Performance

Improving the energy performance of buildings and plants requires managing energy strategically across the entire organization. EPA provides strategies, tools, professional assistance, and recognition opportunities to help you meet your goals and contribute to ENERGY STAR's nationwide challenge to improve the energy efficiency of facilities by 10 percent or more!

Check out these resources:

Guidelines for Energy Management
http://energystar.gov/index.cfm?c=guidelines.guidelines_index

Energy Strategy for the Future
http://energystar.gov/index.cfm?c=business.bus_energy_strategy

Building Upgrade Manual
http://energystar.gov/index.cfm?c=business.bus_upgrade_manual

VSDs, Premium Efficiency Motors Prove to Be Sound Investment for U.S. Bank

When U.S. Bank's Corporate Real Estate group began looking for ways to reduce energy costs, they turned to NorthWestern Energy's Business Partners program for help.

The Great Falls facility, an eight-story building with 99,000 ft² of office space, houses U.S. Bank's primary banking operations as well as several floors of leased office space. The building's occupied spaces are heated and cooled by two primary dual-duct multi-

zone constant volume air handling units. Dual-duct air distribution systems are designed to provide hot air and cold air to every space that they serve. The hot air and the cold air are then mixed, based on local temperature conditions, just before the air enters the conditioned space. These systems are notoriously inefficient.

The primary heating for these units comes from a hot water distribution system fed by two natural gas fired boilers. The primary cooling comes from the building's 300-ton centrifugal chiller via the building's chilled water piping system. The chiller is water-cooled with the assistance of an open cooling tower. These air handling units are the primary source of fresh air for the facility's occupants.

NCAT engineers used a computer simulation program called eQuest to estimate the energy savings associated with several energy conservation options. These analyses determined that a carefully designed set of HVAC improvements would make the most economic sense for this facility. Ultimately, variable speed drives were installed on four supply-air fan motors and two return-air fan motors, several mixing boxes were modified to provide air-flow control and feedback to the new digital process controllers, and existing electric motors were replaced with premium efficiency motors. These measures will collectively save an estimated \$80,000 in energy costs each year.

NCAT developed and submitted a Business Partners Program proposal for this project that was reviewed and approved for co-funding by NorthWestern Energy. With the financial support from NWE, the project has an estimated simple payback of less than two years. Mechanical Technologies, Inc. of Billings installed the drives and controls. ■



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NorthWestern
Energy

Very Cool! MDT Chiller Project Provides More Cooling at Lower Cost

Montana Department of Transportation headquarters building in Helena is more energy-efficient and comfortable these days, thanks to a new chiller installed under the Business Partners program.

Over the past 40 years since its construction, cooling load in the facility has increased substantially, largely due to increased plug load and data centers. Mechanical cooling had been provided by the original 40-year old chiller that was beginning to fail, resulting in increased maintenance costs. To address these concerns, NCAT staff worked with Mark Hines at the state A&E Division to develop a retrofit project for the facility. The high-efficiency replacement unit is a McQuay 446-ton, variable frequency drive, centrifugal chiller with direct digital controls. The new cooling tower fans and secondary chilled water pumps are operated by variable frequency drives. The new chiller, cooling tower, and pumps will lower maintenance costs and increase comfort within the building. Tri-County Mechanical & Electrical, Inc. was the general contractor on the job; Vemco, Inc. provided the chiller.

NorthWestern Energy's Business Partners program provided an incentive to help cover the incremental cost between a standard-efficiency chiller and a high-efficiency chiller. With the incentive, the simple payback was about one and a half years. This project will save the state of Montana 141,365 kWh and \$8,209 annually. ■

Variable Speed Drives: Reduce Power, Increase Savings

Fans, pumps, refrigeration equipment and compressors often don't require continuous full power. You can capitalize on this fact by installing variable frequency drives (VFDs), which convert the incoming AC power to a DC signal and then re-transmitting the power signal to the motor at varying frequencies and voltages. VFDs can operate rotating equipment at speeds ranging from nearly 0 RPM to as high as 150 percent of the rated speed for the motor. VFDs reduce electric consumption, not to mention wear and tear on the motor, saving money and increasing equipment life. Other advantages include less wear on the motor due to reduced speed and torque, gentler starting through gradual acceleration, and fewer moving parts (i.e., no damper or inlet vanes to wear out).

In the past 10 years, variable speed drives (VFDs) for fans, pumps, chillers and HVAC systems has become an affordable way to save energy, thanks to advances in microelectronics and control technology. Increasingly, building designs have been specifying VFDs, and many building HVAC retrofits can become more cost-effective by replacing flow controls with VFD. (Excerpted from: *Use of Variable Frequency Drives for Fan and Pump Control*, Energy Ideas Clearinghouse, www.energyideas.org/) ■

about...

E+ Business Partners provides incentives to electric commercial and industrial customers of NorthWestern Energy for cost-effective electric saving measures in new or existing facilities. Projects could include measures to improve lighting, heating and cooling (HVAC) systems, refrigeration, air handling, and pumping technology upgrades.

NorthWestern Energy contracts with the National Center of Appropriate Technology (NCAT) to provide technical assistance to customers to develop qualifying projects. NCAT is a non-profit organization with extensive experience in energy efficiency. NCAT works with customers, architects, engineers and other trade allies.

Learn more at www.northwesternenergy.com

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Vicki Lynne spends her work days helping electric customers of NorthWestern Energy find cost-effective energy savings in their facilities. Lynne's background is well-suited to this task: She has worked in the areas of renewable energy, energy conservation, and environmental engineering for more than 20 years.



Lynne has special expertise in energy conservation in state buildings, commercial buildings, and schools. Over the past two years, she's helped state, federal, and university system facilities implement electric conservation projects through NorthWestern Energy's Efficiency Plus programs that collectively saved some 1,375,000 kWh each year, worth over \$86,000 in annual electric energy savings.

"As energy prices continue to rise in Montana, it becomes increasingly important for building owners and managers to assess their electric efficiency options," Lynne says. "Participation in Business Partners provides a cost-effective way to analyze available options and has the added bonus of cash rebates to help pay for resulting projects."